

- 16 -

CLATMS:

1. A method for automatically calculating levels of a given chemical in a liquid from a liquid reservoir using colorimetry testing, comprising the steps of:
- (i) collecting in an optical chamber a sample of liquid from a liquid reservoir;
 - (ii) taking a calibration colorimetry reading of said liquid sample, whereby a reference voltage value representative of an acceptable limit of a known chemical is calculated and stored in a memory of a controller unit;
 - (iii) releasing said liquid sample from said optical chamber;
 - (iv) collecting in the optical chamber a further sample of liquid from said liquid reservoir;
 - (v) adding a predetermined quantity of a reagent to said further sample in said chamber, said reagent chosen as having properties making it react to the presence of the known chemical present or to be added to said liquid; and
 - (vi) taking a test colorimetry reading of said further sample with said reagent added thereto and obtaining a voltage signal representative thereof, whereby a level of said known chemical in said liquid is known with respect to said reference voltage value.
2. The method according to claim 1, wherein step (iii) further comprises rinsing said optical chamber so as to prepare same for receiving said further sample.
3. The method according to claim 1, wherein the liquid reservoir is a swimming pool, the liquid is water and the known chemical is chlorine.
4. A chemical level calculator computer program product comprising code means recorded in a computer readable memory for executing the method defined in claim 1.

00558447-054704

- 17 -

5. A method for automatically calculating and controlling levels of a given chemical in a liquid from a liquid reservoir using colorimetry testing, said method comprising the steps of:

- (i) collecting in an optical chamber a sample of liquid from a liquid reservoir;
- (ii) taking a calibration colorimetry reading of said liquid sample, whereby a reference voltage value representative of an acceptable limit of a known chemical is calculated and stored in a memory of a controller unit;
- (iii) releasing said liquid sample from said optical chamber;
- (iv) collecting in the optical chamber a further sample of liquid from said liquid reservoir;
- (v) adding a predetermined quantity of a reagent to said further sample in said optical chamber, said reagent chosen as having properties making it react to the presence of the known chemical present or to be added to said liquid;
- (vi) taking a test colorimetry reading of said further sample with said reagent added thereto and obtaining a voltage signal representative thereof, whereby a level of said known chemical is known with respect to said reference voltage value; and
- (vii) adding a calculated quantity of said known chemical to said liquid reservoir in response to the calculated level of said known chemical in said further sample if the calculated level is below said reference voltage value.

6. The method according to claim 5, wherein step (vii) includes not adding said known chemical if the calculated level thereof is above said reference voltage value.

7. The method according to claim 6, wherein the steps (i) to (vii) are repeated until the calculated level of said known chemical is above said reference voltage value.

0058447-05104

8. The method according to claim 7, wherein step (vii) further includes actuating an alarm if a certain amount of test colorimetry readings are successively below said reference voltage value.
9. The method according to claim 5, wherein step (iii) further comprises rinsing said optical chamber so as to prepare same for receiving said further sample.
10. The method according to claim 5, wherein the liquid reservoir is a swimming pool, the liquid is water and the known chemical is chlorine.
11. A chemical level calculator computer program product comprising code means recorded in a computer readable memory for executing the method defined in claim 5.
12. An automatic liquid analyser for calculating levels of a given chemical in a liquid from a liquid reservoir using colorimetry testing, said automatic liquid analyser comprising:
 - an optical chamber for receiving liquid samples therein, said optical chamber being connected to a liquid reservoir by a liquid inlet line, and being connected to a drain by a sample outlet line;
 - a first pumping device being mounted on said liquid inlet line and adapted for conveying samples of liquid from said liquid reservoir to said optical chamber;
 - a valve being mounted on said sample outlet line for opening and closing same so as to release and retain liquid in said optical chamber;
 - at least a first reagent reservoir for storing a reagent;
 - a reagent line extending between said reagent reservoir and said optical chamber;
 - at least a second pumping device being mounted on said reagent line and adapted for conveying predetermined

- 19 -

quantities of said reagent from said reagent reservoir to said optical chamber;
a light source mounted to said optical chamber for emitting a light signal for colorimetry testing;
a light detector mounted to said optical chamber opposite said light source and aligned therewith for receiving said light signal for colorimetry testing; and
a controller unit for calculating the level of a known chemical according to intensity of said light signal detected and for controlling said automatic liquid analyser according to the method defined in claim 1, said controller unit having a display screen to indicate the level of the known chemical.

13. The apparatus according to claim 12, wherein said optical chamber is comprised of opaque walls so as to isolate liquid contained therein from external light.

14. The apparatus according to claim 12, wherein the liquid reservoir is a swimming pool, the liquid is water and the known chemical is chlorine.

15. The apparatus according to claim 14, wherein the reagent is orthotolidine.

16. An automatic liquid analyser and quality controller for controlling levels of a given chemical in a liquid from a liquid reservoir using colorimetry testing, said automatic liquid analyser and quality controller comprising:

an optical chamber for receiving liquid samples therein, said optical chamber being connected to a liquid reservoir by a liquid inlet line, and being connected to a drain by a sample outlet line;

a first pumping device being mounted on said liquid inlet line and adapted for conveying samples of liquid from said liquid reservoir to said optical chamber;

09853447 "051704
FOI 253 24435889

- 20 -

a valve being mounted on said sample outlet line for opening and closing same so as to release and ~~retain~~ liquid in said optical chamber;

at least a first reagent reservoir for storing a reagent;

a reagent line extending between said reagent reservoir and said optical chamber;

at least a second pumping device being mounted on said reagent line and adapted for conveying predetermined quantities of said reagent from said reagent reservoir to said optical chamber;

a light source mounted to said optical chamber for emitting a light signal for colorimetry testing;

a light detector mounted to said optical chamber opposite said light source and aligned therewith for receiving said light signal for colorimetry testing;

a chemical reservoir for storing an amount of a known chemical, said chemical reservoir being adapted to be mounted to a portion of said liquid reservoir, and having conveying means extending therefrom to the portion of said liquid reservoir and being actuated by a motor for adding calculated quantities of said known chemical to said liquid reservoir; and

a controller unit for calculating the level of said known chemical according to intensity of said light signal detected and for controlling said automatic liquid analyser and quality controller according to the method defined in claim 5.

17. The apparatus according to claim 16, wherein said optical chamber is comprised of opaque walls so as to isolate liquid contained therein from external light.

18. The apparatus according to claim 16, wherein the liquid reservoir is a swimming pool, the liquid is water and the known chemical is one of chlorine and bromine.

09858447 051701

- 21 -

19. The apparatus according to claim 18, wherein the reagent is orthotolidine.

20. The apparatus according to claim 16, wherein said conveying means comprise an endless screw axially disposed in a cylindrical container.

0953447.051704